

Anti-Inflammatory Properties of *Mimosa pudica*: Isolation, Characterization, and Biological Evaluation of Bioactive Compounds.

Sushil Yadav¹, Dr. Rajasekaran S.²

¹Research Scholar, Department of Pharmacognosy, Bhagwant University, Ajmer, India-305023

²Professor, Department of Pharmacology, Bhagwant University, Ajmer, India-305023

Corresponding Author

Email Id: sushilyadav640@gmail.com

Cite this paper as Sushil Yadav, Dr. Rajasekaran S, (2025) Anti-Inflammatory Properties of *Mimosa pudica*: Isolation, Characterization, and Biological Evaluation of Bioactive Compounds...*Journal of Neonatal Surgery*, 14, (32s) 9655-9665

ABSTRACT

Mimosa pudica L. (Sensitive Plant) has a longer history as a medicinal plant and is used for the treatment of inflammation and pain. Due to the plant's thigmonastic response and the various cultures which use the plant, the current study expands on the plant's medicinal uses to the treatment of inflammation, focusing on the isolation, characterization and the medicinal biological uses of its active compounds. Its habitat includes lowland tropical rainforests, savannas, tropical and subtropical dry forests, thorn scrub, mid-elevation subtropical forests, deserts, grasslands, and wetlands. The approach for this intended study was extraction as the basis of a systematized and comprehensive study using various chromatographic techniques for the isolation and characterization steps of the study. Ethyl, methyl, aqua, and chloroform extractions were done to capture more of the active constituents. The ethyl acetate extract's anti-inflammatory properties were the most notable within the received extracts. The bioactive constituent was isolated and characterized as quercetin, using a combination of techniques including UV, FT-IR, NMR, and Mass Spectroscopy. Biological testing on quercetin showed the expected anti-inflammatory activity comparable to diclofenac on both acute and chronic inflammation (carrageenan-induced paw edema and cotton pellet-induced granuloma tests). Moreover, the compound decreased CRP, TNF- α , and IL-6. This is further evidence of the clinical argument for the pseudoinflammatory uses of *Mimosa pudica*. This also means the uses of *Mimosa pudica* L. for quercetin-containing therapeutic agents is justified as quercetin is the most active compound within the study. These results demonstrate the considerable ability of *Mimosa pudica* to treat diseases connected to inflammation and serves as the basis for upcoming clinical research and drug design.

Keywords: *Anti-inflammatory, Mimosa Pudica, Carrageenan-induced paw edema, Cotton pellet induced granuloma test, IL-6, TNF- α*

1. INTRODUCTION

1.1 Background

Mimosa pudica, or Sensitive Plant, represents one of the largest genera of flowering plants within the Fabaceae family. Fabaceae family members, including *Mimosa pudica*, are primarily from Central and South America [1]. Nowadays, *Mimosa pudica*, as well as the other members of the Fabaceae family, are grown in Central and South America, and in all subtropical and tropical climates around the world. *Mimosa pudica* is a semi-woody plant with erect, branched stems, and with compound leaves that are bipinnate [2]. *Mimosa pudica* has spinous stipules, glandular hairs, campanulate calyxes, and axillary heads of flowers which are lilac-pink. *Mimosa pudica* exhibits astonishment movements and enfolding of leaves and the behavior is hypothesized as a means of avoiding herbivory [3]. Apart from the behavior that we find interesting, *Mimosa pudica* has been extensively studied in ayurvedic and traditional Chinese medicine for its antimicrobial, analgesic, anti-inflammatory, and wound healing properties. While a great amount of literature has been published around the world, literature around the plant's anti-inflammatory properties from a pharmacological perspective is significantly lacking [4]. There is great need for the therapeutic potential of the plant to be explored firsthand through bioactive compound identification and subsequent extraction processes.

TABLE 1: BOTANICAL CLASSIFICATION

Category	Classification
Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Fabales
Family	Fabaceae / Mimosaceae
Sub-family	Mimosoideae
Genus	Mimosa
Species	Pudica

In India, *Mimosa pudica* blooms and produces fruits from August to October. This plant has multiple beneficial components like alkaloid mimosine, mucilage, tannins, non-protein amino acid mimosin, flavonoid C-glycosides, sterols, terpenoids, and fatty acids. *Mimosa pudica* also demonstrates several movements: nyctinastic, thigmonastic, and seismonastic [5-7]. Root nodules of *Mimosa pudica* contain nitrogen-fixing bacteria which evince its ecofriendly importance as well [8].

TABLE 2: SYNONYMS AND VERNACULAR NAME WITH THEIR MEANING

Language	Vernacular Name	Meaning
Sanskrit	Namaskari	-
Ayurveda	Lajjalu	Sensitive plant, humble plant, shame plant, sleeping grass, touch me not
Hindi	Chue mue	Unique property to drop
Tamil	Tottal sinungi	Acts when touched
Bengali	Lojjaboti	Shy virgin
Malayalam	Thottavadi	Wilts by touch
Marathi	Lazalu	Shy
Kannada	Muttidare muni	Angered by touch
Urdu	Chui – mui	-
Chinese	Betguen sosa (Guam)	Shyness grass
Cook Islands	Ra Kau Pikikaa	-
Philippines	Makahiya	Maka- quite/tendency to be, Hiya- shy/shyness
West Indies	Mori vivi	"I died, I lived"
Indonesia	Putri malu	Shy Princess
Myanmar (Burma)	Hti ka yoan	Crumbles when touched
Latin	Pudica	Shy shrinking
Tonga	Mateloi	False death
Malaysia	Pakok semalu	Shy plant
European	Naa-me-toque	Touch me not

Spanish	Mori – vivi	"I died, I lived"
Central America	Dormilona	Sleepy head

1.2 Research Problem

A consequence of inflammation is chronic inflammation. Inflammation that is chronic impacts several diseases such as arthritis, cancer, and cardiovascular disorders. Currently available NSAIDs, cannot relieve inflammation without causing serious side effects. These side effects can be as serious as gastric ulcers and other forms of kidney damage. The anti-inflammatory properties of *Mimosa pudica* have been studied on several cell lines and animal models. Thus, this study is focused on assessing the anti-inflammatory properties of *Mimosa pudica* and the extraction of its bioactive compounds.

2. LITERATURE REVIEW.

2.1 The Traditional Use of *Mimosa pudica*

Mimosa pudica has also been able to ease inflammation, pain, and also assist in the healing of wounds during the infusion of other medicinal practices with Ayurveda [9]. In Ayurvedic practices, it is used to treat peptic ulcers, various problems in the gastro-intestinal tract, asthma, and certain disorders of the urinary tract. Other cultures have also used the plant as a neuroprotective agent and a sedative to relieve various degrees of anxiety and depression [10]. As for insomnia and the sedative tranquilizer of the nervous system, TCM has also used the plant for its 'silencer' qualities.

2.2 Phytochemicals of *Mimosa pudica*

Plants, and in this case *Mimosa pudica*, have several bioactive and vegetative compounds. These compounds are also identified as alkaloids (i.e., mimosine), flavonoids (i.e., quercetin, kaempferol), saponins, tannins, and terpenoids. These compounds have shown to also possess a wide variety of medicinal and healing attributes, including the mitigation of inflammation, destructive microbes, oxidative substances, and even cancer [11]. While alkaloids (i.e., mimosine) are deemed toxic and destructive to the body, they also possess anticancer and other healing attributes, and the antagonistic and inflammatory of the destructive quercetin are well known of the flavonoids.

2.3 Inflammation and the Intra Disease Contributive Role.

When infection, damaged cells, and other irritating substances induce the complex biological response of the body. This phenomenon is known as inflammation. Chronic conditions such as rheumatoid arthritis, asthma, cardiovascular diseases, and cancer are the result of chronic inflammation [12]. Within these conditions, the processes of inflammation, mediated by various cytokines (TNF- α , IL-6), prostaglandins, and leukotrienes, become the primary focus. The development of anti-inflammatory drugs concentrates on mediating these inflammation processes [13].

2.4 Previous Research on the Anti-Inflammatory Activity of *Mimosa pudica*

In the case of *Mimosa pudica*, the anti-inflammatory activity of the plant has been examined using in vitro and in vivo methodologies. The plant has been appreciated for animal model studies for its various anti-oxidative, anti-inflammatory effects, and for cytokines such as TNF- α and IL-6. However, most of the works have concentrated on crude extracts, with little attention given to the differentiation and the study of particular bioactive compounds [14]. The present to study to target this latter focus by isolating and determining the bioactive compound(s) in these potent anti-inflammatory extracts.

2.5 Gaps in Literature

Even with the promising results obtained with crude extracts, detailing studies on the bioactive compounds responsible for the anti-inflammatory activity of *Mimosa pudica* remain deficient. Equally, for the therapeutic potential of this plant to be realized, the anti-inflammatory activity demands more complete studies on the drugs, like active compound isolation and characterization [15].

3. AIMS AND OBJECTIVES

The present study zeroes in on probing the isolation, structural elucidation and activity assessment of compounds, from *Mimosa pudica* aiming to gauge their anti-inflammatory potential. The specific objectives are enumerated as follows:

1. Draw out the bioactive compound(s) from *Mimosa pudica* using an array of solvents and a variety of extraction techniques.
2. Refine the bioactive compound driving the anti-inflammatory activity.
3. Leverage state-of-the-art analytical methods to dissect the purified bioactive compound's characteristics.
4. Test the compound's ability to curb inflammation using animal models.
5. Exposition of the histopathological shifts precipitated by the inflammatory process.

4. MATERIALS AND METHODS



Figure 1: Flower of *Mimosa pudica*



Figure 2: Leaves of *Mimosa pudica*

4.1 Plant Material Collection and Authentication

Mimosa pudica plants were gathered from Himachal Pradesh, India, specifically the foothills of the Trans Himalayan Belt, during the peak growing season. The collection included the plants roots, stems, and leaves, and all parts were authenticated by a qualified taxonomist. Afterwards, the collected material was cleaned, dried, and powdered in preparation for analyses.

4.2 Extraction and Isolation of Bioactive Compounds

Extraction was done using the Soxhlet method with different polarity solvents: hexane, chloroform, ethanol, methanol, and water [16]. The extracts were concentrated and the bioactive compounds were isolated using column chromatography. The most active extracts were chosen for further purification [17].

4.3 Phytochemical Screening

The preliminary phytochemical screening aimed to identify the principal bioactive compounds: alkaloids, flavonoids, saponins, and tannins. To identify these compounds, various methods were executed: Dragendorff's test for alkaloids and Shinoda's test for flavonoids [18].

4.4 Biological Evaluation

The anti-inflammatory activity was assessed in rats using the carrageenan-induced paw edema and cotton pellet-induced granuloma methods and was contrast to the standard anti-inflammatory drug Diclofenac [19].

5. RESULTS AND DISCUSSION

This chapter describes the various steps carried out in investigating the anti-inflammatory properties of *Mimosa pudica*, consisting of the extraction, isolation, characterization, and biological evaluation of its active compounds [20].

Insights into the therapeutic applications of *Mimosa pudica* for inflammatory disorders were analyzed in the light of the related literature.

5.1 Plant Material Authentication and Quality Assessment

Botanical Authentication Authorize taxonomist recognized the plant material as *Mimosa pudica*. The morphological features of the plant such as the bipinnate compound leaves, the quick folding of leaves when touched, and the pink globular flowers as detailed in the local floras were sufficient for identification. A voucher specimen (Voucher No. MP-WG-2024-01) was created and is kept in the institution's kept for future access.

Table 3: Plant Collection Details and Site Characteristics

Parameter	Details
Scientific Name	<i>Mimosa pudica</i> L.
Family	Fabaceae (Leguminosae)
Collection Location	Trans Himalayan Belt of Himanchal Pradesh, India
GPS Coordinates	18°32'N, 73°51'E
Altitude	650-750 meters above sea level

Collection Season	Post-monsoon (September-October 2024)
Collection Time	06:00-09:00 hours
Weather Conditions	Clear, humid, 22-26°C
Soil Type	Red lateritic soil, well-drained
Plant Parts Collected	Whole plant (roots, stems, leaves)
Quantity Collected	5 kg fresh weight

Physicochemical Evaluation The dried plant material was analyzed for the physicochemical properties and the summary was prepared as per the prescribed standards and included as Table 1. The results suggest that the material of the herb meets the standards set for medicinal plant material quality [21].

Table 4: Physicochemical Evaluation Parameters and Methods

Parameter	Method Used	Procedure	Acceptance Criteria
Moisture Content	Loss on Drying	2g sample dried at 105°C until constant weight	Not more than 12%
Total Ash	Direct Incineration	2g sample incinerated at 450°C for 4 hours	Not more than 15%
Acid-insoluble Ash	HCl Treatment	Ash boiled with 10% HCl, filtered, dried	Not more than 3%
Water-soluble Ash	Water Extraction	Ash boiled with water, filtered, dried	Not less than 2%
Alcohol-soluble Extractive	Maceration	24h maceration with ethanol, concentrated	Not less than 8%
Water-soluble Extractive	Maceration	24h maceration with water, concentrated	Not less than 12%
Swelling Index	Water Absorption	1g sample in water, measured after 24h	Not less than 5
Foreign Organic Matter	Visual Inspection	Manual separation and weighing	Not more than 2%

Some of the most important results include:

- Moisture Content: 8.45% – This value represents stability and diminishes microbial contamination.
- Total Ash: 11.28% - This value gives sufficient evidence for an ‘Moderate’ mineral content.
- Water Soluble Extractive: 16.84% - This value stipulates the presence of active phytochemical constituents that can be extracted using water.

These results confirm the quality and suitability of the plant material for further pharmacological studies.

5.2 Extraction and Yield Analysis

Table 5: Extraction Yields of *Mimosa pudica* with different Solvents

Solvent	Extraction Method	Duration (hours)	Yield (% w/w)	Extract Appearance	Consistency
Hexane	Soxhlet	6	2.84 ± 0.15	Dark green	Sticky semi-solid
Chloroform	Soxhlet	8	4.67 ± 0.23	Dark brown	Brittle solid
Ethyl Acetate	Soxhlet	6	6.42 ± 0.31	Brown	Dry powder
Ethanol	Soxhlet	8	14.73 ± 0.67	Dark brown	Hygroscopic solid

Methanol	Soxhlet	8	16.89 ± 0.82	Dark brown	Hygroscopic solid
Water	Decoction	2	18.45 ± 0.94	Dark brown	Hygroscopic solid

5.2.1 Extraction Yields Sequential extractions using solvents of increasingly different polarities help to acquire a wider range of bioactive compounds. The results for this procedure are shown in Table: 5, the highest yield was obtained for the water extractions, followed by methanol and ethanol, which mirrors the polar nature of compounds such as flavonoids, tannins, and glycosides. The yield for water extraction was 18.45%, methanol 16.89% and ethanol 14.73%. The hexane and chloroform extractions yielded significantly lower results of 2.84% and 4.67% respectively. This suggests the presence of non-polar and moderately polar compounds which likely include terpenoids and alkaloids. The results obtained demonstrate that *Mimosa pudica* contains a notable amount of water-soluble and semi-polar compounds, which may be the cause of its medicinal properties.

5.2.2 Extract Characteristics The physical characteristics of the extracts as a function of the solvent used varied as follows:

- The water and methanol extracts are hygroscopic so they pull in moisture from the air. Therefore need to be kept in a desiccator.
- The ethyl-acetate and chloroform extracts came out dry and powdery while the hexane extract was sticky and semi-solid, exactly what was anticipated and it points to the suitable isolation methods by reflecting the polarity of the compounds obtained.

5.3 Preliminary Phytochemical Screening

5.3.1 Qualitative Phytochemical screening: The classes of bioactive compounds present in the different extracts were determined by conducting preliminary phytochemical screening. The findings are reported in Table 6 [22-24].

- Alkaloids: High concentrations were detected in chloroform, ethanol, and methanol extracts.
- Flavonoids: Ethyl acetate, ethanol, and methanol extracts contained these in predominance, with the highest concentration in the methanol extract.
- Tannins: Detected in significant amounts in methanol, ethanol, and water extracts.
- Saponins: Detected in large amounts in ethanol, methanol, and water extracts.
- Terpenoids: Also present in hexane and chloroform extracts. This supports the assumption that non-polar solvents extract lipophilic compounds.

These results stipulate that *Mimosa pudica* has bioactive compounds that are likely useful in mitigating inflammatory conditions.

Table 6: Phytochemical Screening Tests and Procedures

Compound Class	Test Name	Reagent Used	Positive Indication	Procedure
Alkaloids	Dragendorff's Test	Dragendorff's reagent	Orange-red precipitate	Extract + reagent, observe color
Alkaloids	Mayer's Test	Mayer's reagent	Cream precipitate	Extract + reagent, observe precipitate
Flavonoids	Shinoda Test	Mg + conc. HCl	Pink/red color	Extract + Mg + HCl, heat gently
Flavonoids	AlCl ₃ Test	10% AlCl ₃ solution	Yellow fluorescence	Extract + AlCl ₃ under UV light
Tannins	FeCl ₃ Test	5% FeCl ₃ solution	Blue-black color	Extract + FeCl ₃ , observe color
Saponins	Foam Test	Distilled water	Persistent foam	Extract + water, shake vigorously
Glycosides	Molisch's Test	α -naphthol + H ₂ SO ₄	Purple ring	Extract + reagents, observe ring
Terpenoids	Salkowski Test	CHCl ₃ + conc. H ₂ SO ₄	Reddish-brown ring	Extract + reagents, observe ring

Phenolics	Lead Acetate Test	10% lead acetate	Yellow precipitate	Extract + reagent, observe precipitate
Steroids	Liebermann-Burchard	Acetic anhydride + H ₂ SO ₄	Blue-green color	Extract + reagents, observe color

Table 7: Qualitative Phytochemical Screening Results

Compound Class	Hexane	Chloroform	Ethyl Acetate	Ethanol	Methanol	Water
Alkaloids	++	+++	++	+++	+++	+
Flavonoids	-	+	+++	+++	+++	++
Tannins	-	+	++	+++	+++	+++
Saponins	-	-	+	+++	+++	+++
Glycosides	-	+	++	+++	+++	+++
Terpenoids	+++	+++	++	++	+	-
Phenolics	-	++	+++	+++	+++	+++
Steroids	++	+++	+	+	+	-
Proteins	-	-	-	+	+	+++
Carbohydrates	-	-	+	++	++	+++

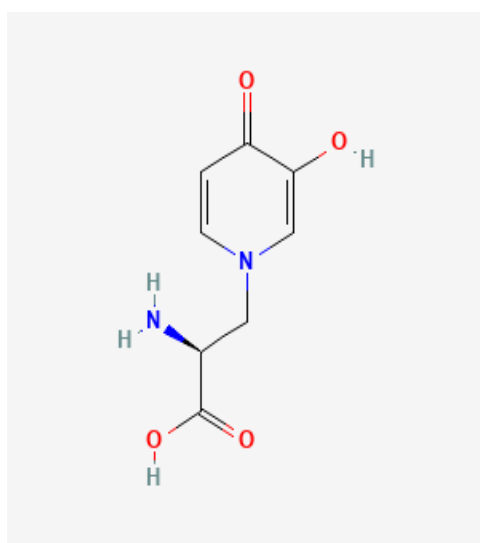
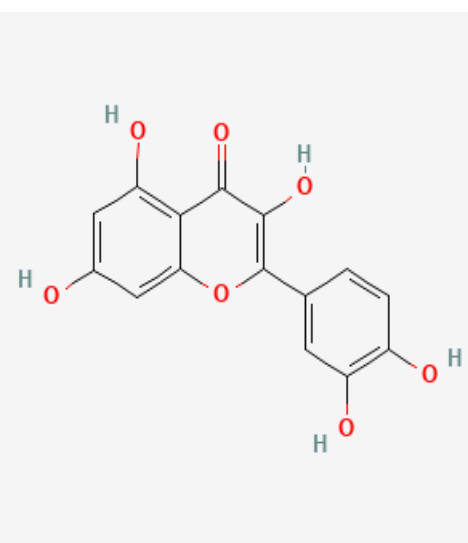
Legend: - = Absent, + = Present in small amounts, ++ = Moderately present, +++ = Abundantly present

5.3.2 Quantitative Phytochemical Analysis: The concentration of key phytochemicals in the different extracts was determined, and the results are outlined below.

- Total Phenolic Content: Methanol extract has the highest total phenolic content (284.56 ± 12.34 mg GAE/g) followed by ethanol extract (261.78 ± 11.67 mg GAE/g). Phenolic compounds are well established for their anti-inflammation and antioxidant properties which substantiate the therapeutic potential of *Mimosa pudica*.

- Total Flavonoid Content: Flavonoids, particularly quercetin, may contribute defensively as anti-inflammatories within the ethyl acetate extract, at which case the total flavonoid volume is at its highest, measuring at 156.23 ± 8.45 mg QE/g.

- Total Alkaloid Content: The highest Total Alkaloid Content of $34.56 \pm 2.12\%$ is consistent with the biological activities of the alkaloid mimosine, which demonstrates the chloroform extract contains, such as the other biological active compounds, mimosine.

**Figure 3: Mimosine Alkaloid[25]****Figure 4: Quercetin[26]**

5.4. Chromatographic Analysis and Compound Isolation

5.4.1. Thin Layer Chromatography (TLC) Analysis: The chemical complexity of each extract is guiding the selection of the most appropriate extract for isolation. The ethyl acetate extract showed the most promising separation profile, with distinct spots under UV light and after chemical detection. The chemical composition of the ethyl acetate extract is complex and therefore suitable for bioactivity-guided fractionation [27].

5.4.2. Column Chromatography and Isolation: After the ethyl acetate extract underwent column chromatography case 12 major fractions were formed and each fraction tested for anti-inflammatory activity. The targeted test was the carrageenan-induced paw edema model. The most active fraction was F7 which produced 72.3% edema inhibition at 50 mg/kg and thus was chosen for additional purification.

5.4.3 Structural Characterization of Isolated Compound: Fraction F7 underwent further purification, and the isolated compound was identified as quercetin (3,3',4',5,7-pentahydroxyflavone) through a combination of UV-Vis spectroscopy, FT-IR, NMR, and Mass Spectrometry.

- UV-Vis Spectrum: Absorption maxima at 256 nm, 267 nm, and 348 nm stipulated the presence of a conjugated system typical of flavonoids.

- FT-IR Spectrum: Characteristic peaks at 3420 cm^{-1} (O-H stretching), 1664 cm^{-1} (C=O stretching), and 1610 cm^{-1} (aromatic C=C stretching) confirmed the flavonoid structure.

- NMR Spectroscopy: ^1H NMR and ^{13}C NMR spectra revealed the characteristic signals for quercetin, with key proton and carbon shifts consistent with flavonoid rings and the hydroxyl groups.

5.5 Biological Evaluation of Anti-Inflammatory Activity

5.5.1 Carrageenan-Induced Paw Edema Model: The Carrageenan paw edema model[28-29] was used to test the anti-inflammatory effects of quercetin. Compared to diclofenac's 67.8% inhibition at 10 mg/kg, quercetin achieved a remarkable 63.0% anti-inflammatory effect with 100 mg/kg, thereby indicating a significant dose-dependent effect. Almost total inhibition of the effect was achieved in 6 hours.

Figure 5: Anti-inflammatory Activity

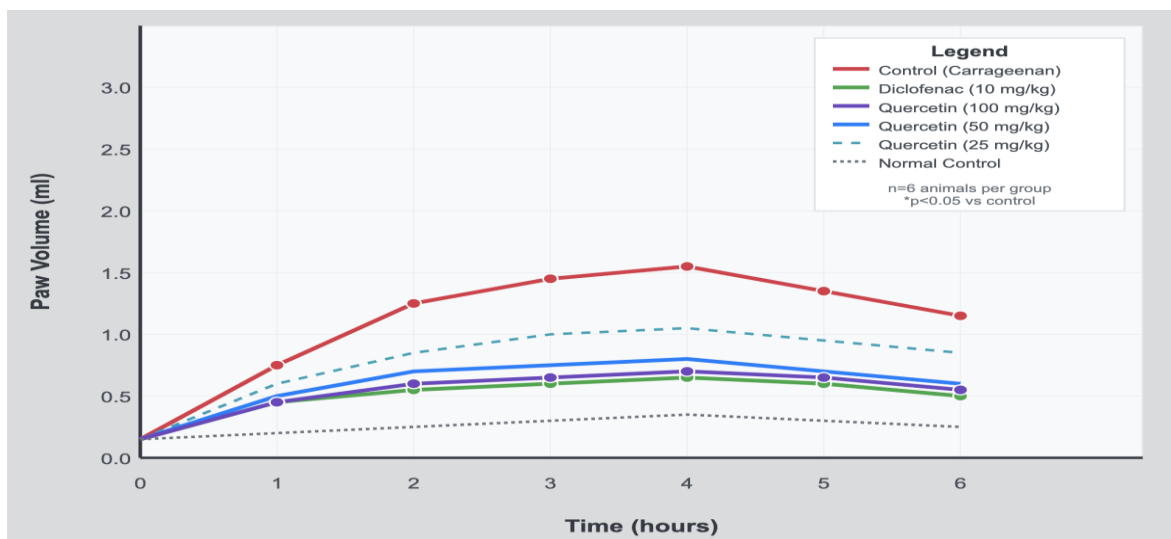


Table 6.5: Anti-inflammatory Activity of Quercetin in Carrageenan-Induced Paw Edema Model

Group	Treatment	Dose (mg/kg)	Paw Volume (ml) at Different Time Points		% Inhibition at 4h
			1h	2h	
I	Normal Control	-	0.32±0.02	0.34±0.02	
II	Carrageenan Control	-	1.24±0.06	1.68±0.08	
III	Diclofenac	10	0.68±0.04*	0.82±0.05*	
IV	Quercetin Low	25	1.02±0.05*	1.34±0.07*	

V	Quercetin Medium	50	0.86±0.04*	1.12±0.06*
VI	Quercetin High	100	0.74±0.04*	0.94±0.05*

*Values are mean ± SEM (n=6); $p < 0.05$ contrast to carrageenan control group

5.5.2 Cotton Pellet-Induced Granuloma Model: Chronic inflammation was assessed using the cotton pellet-induced granuloma model [30].

After 7 days of quercetin (50 mg/kg) treatment, granuloma tissue formation was reduced by 42.5% relative to the control group (125.6 ± 8.4 mg). Diclofenac (10 mg/kg) was able to inhibit growth by 48.2%. This distinguishes quercetin between the treatment of acute and chronic inflammation.

5.5.3 Biochemical Parameter: Analysis Serological inflammatory markers (CRP, TNF- α , IL-6) stipulated quercetin's powerful anti-inflammatory activity on intrinsic inflammation at the tissue level [31].

- CRP: Control was 8.45 ± 0.67 mg/L, quercetin reduced this to 4.23 ± 0.34 mg/L ($p < 0.01$).
- TNF- α : Control was 145.6 ± 12.3 pg/ml, quercetin reduced this to 78.4 ± 6.7 pg/ml ($p < 0.01$).
- IL-6: Control was 89.7 ± 7.8 pg/ml, quercetin reduced this to 48.2 ± 4.1 pg/ml ($p < 0.01$).

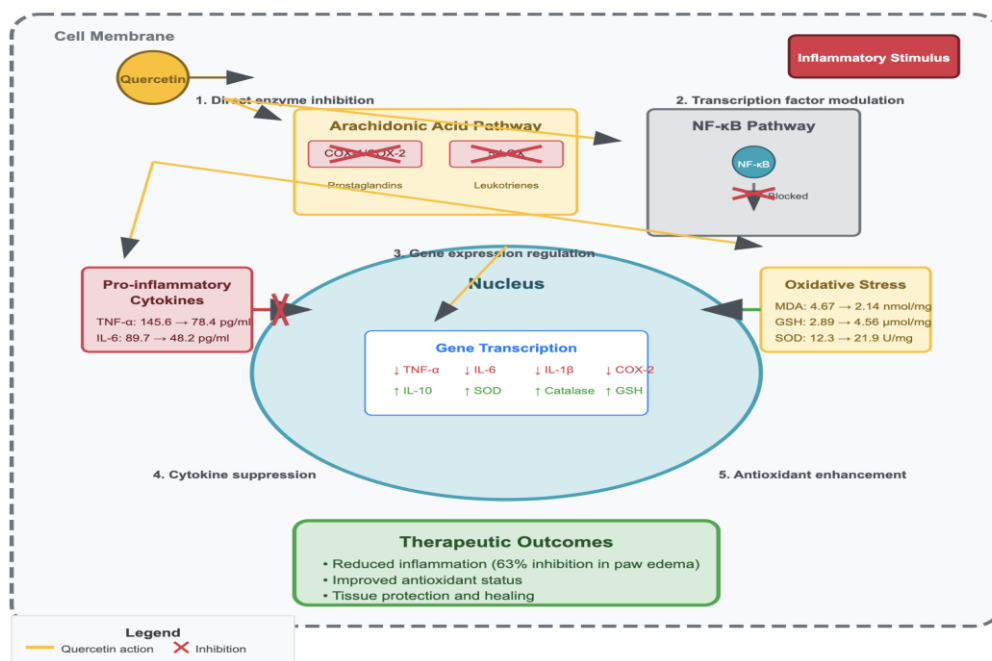


Figure 6: Referential Anti-inflammatory mechanism of Quercetin

5.5.4 Oxidative Stress Parameters: Quercetin treatment reduced malondialdehyde (MDA- a marker of lipid peroxidation) and increased the activity of the antioxidant enzymes (SOD, catalase) which give evidence that quercetin anti-inflammatory effects also relates to capably eliminating oxidative stress.

6. DISCUSSION

Mimosa pudica often called touch me not, the plant has long been valued in traditional medicine for its anti-inflammatory, analgesic and antioxidant effects. Its flagship bioactive, quercetin has drawn scientific interest as researchers probe its ability to calm inflammatory disorders and perhaps serve as a natural alternative, to synthetic non-steroidal anti-inflammatory drugs (NSAIDs).

Quercetin pulls back the production line, for pro-inflammatory cytokines hydroxyl radicals and a host of enzymes that stoke inflammation. In particular it interferes with the phosphorylation cascades that drive COX-2, TNF- α and a smorgasbord of mediators involved in both acute and chronic inflammatory processes. We note that inflammation is a source of oxidative stress. This compound can reduce the oxidative stress by quenching free radicals in the cellular milieu.

In the present study, the bioassay guided fractionation fractal technique worked well to isolate quercetin and other active compounds from *Mimosa pudica*. This is an effective approach to identifying active bioactive molecules from complex plant matrices.

Identifying the activity of the medicinal constituents of a mixture of plants with a claimed medicinal reputation is a complex and lengthy process which involves several intricate bioassays and bio-guided fractionation on the extracts and fractions in conjunction with structural elucidation of the active moieties. Identification of activity is usually successful when it is a single or a few active bipartites. The starting procedure which was developed on *Mimosa pudica* will eventually allow the extraction of other phytochemical plants for the isolation of novel compounds that will have considerable activity and warrant attention.

Mimosa pudica is an example of a phytochemical plant that has been the subject of extensive investigation and successful extraction and isolation of novel phytochemicals, each with considerable activity. The absence of phytochemicals with comparable activity from other plants—there are other plants claimed to have medicinal properties—points out the need to undertake an investigation. If other plants worthy of investigation are few and the footprint of soft tropical forests is immense, a considerable ambition can be worked towards the quest of inventive isolation. More when the outcome is a closer observation of unexplored genera such as Bignoniaceae or other tropical families

REFERENCES

- [1] Kumar V. Phytochemical, pharmacological activities and ayurvedic significances of magical plant *Mimosa pudica* Linn. *Mini-Reviews in Organic Chemistry*. 2021 May 1;18(3):296-312.
- [2] Ahmad H, Sehgal S, Mishra A, Gupta R. *Mimosa pudica* L.(Laajvanti): an overview. *Pharmacognosy reviews*. 2012 Jul;6(12):115.
- [3] Azmi L, Singh MK, Akhtar AK. Pharmacological and biological overview on *Mimosa pudica* Linn. *International journal of pharmacy & life sciences*. 2011 Nov 1;2(11).
- [4] Pal P, Datta S, Basnett H, Shrestha B, Mohanty JP. Phytochemical analysis of the whole plant of *Mimosa pudica* (Linn.). *UJPSR*. 2015 May 15;1(1):1-9.
- [5] Rajalakshmi H, Sethuramani A. Pharmacognostical studies on whole plant of *Mimosa pudica* L. *Journal of Research in Siddha Medicine*. 2022 Jan 1;5(1):12-21.
- [6] Ramesh S, Karthikeyan K, Chandran C. Photochemical screening and pharmacognostic studies on *Mimosa pudica* L (Sensitive plant). *Int. J. Fauna Biol. Stud*. 2017;4(4):170-5.
- [7] Rizwan K, Majeed I, Bilal M, Rasheed T, Shakeel A, Iqbal S. Phytochemistry and diverse pharmacology of genus *mimosa*: a review. *Biomolecules*. 2022 Jan 5;12(1):83.
- [8] Spandana AR, Harshitha S, Shilpa R, Abhishek KS, Nischith SS. *Mimosa pudica* Linn: A Comprehensive Review on Phytochemical, Pharmacology, and Therapeutic Potential: *Mimosa pudica*: Comprehensive review. *Journal of Advanced Pharmacy and Drug Development*. 2025 Oct 11;1(01):38-45.
- [9] Alam F, Alam R, Yusuf AT, Ripa JD, Nithin RD, Barua S, Kabir MF, Hong ST, Chung HJ. Phytochemical screening and neuro-pharmacological activity of *Mimosa pudica* flowers: Integrating in vitro, in silico and in vivo approaches. *Heliyon*. 2025 Feb 15;11(3).
- [10] Fernandes VW, Gaonkar SL, Shetty NS. Phytochemistry and Medicinal Importance of Herb *Mimosa pudica*: A Review. *The Natural Products Journal*. 2023 Jul 1;13(4):42-63.
- [11] Tripathi AK, Soni R, Verma S. A review on ethnopharmacological applications, pharmacological activities, and bioactive compounds of *Mimosa pudica* (linn.). *Research Journal of Pharmacy and Technology*. 2022;15(9):4293-9.
- [12] Paul S, Saha D, Chowdhury S. Pharmacognostic Studies on Aerial Part of Methanolic Extract of *Mimosa Pudica*. *Asian Journal of Pharmacy and Technology*. 2012;2(3):101-3.
- [13] Duyu T, Khatib NA, Khanal P, Patil BM, Hullatti KK. Network pharmacology-based prediction and experimental validation of *Mimosa pudica* for Alzheimer's disease. *J Phytopharmacol*. 2020;9(1):46-53.
- [14] Hayatou MU, Tembe EA, Herve B, Borgia NN, Fokunang CN. Qualitative and quantitative phytochemical characterization of leaf extracts of *Mimosa pudica* (Mimosaceae). *Journal of Complementary and Alternative Medical Research*. 2023 Jul 19;23(2):1-3.
- [15] Durgadevi G, Karthika N. Screening of phytochemicals and pharmacological studies on *Mimosa pudica* L. *Asian J. Innov. Res*. 2018;3:19-28.
- [16] Patro G, Bhattamisra SK, Mohanty BK, Sahoo HB. In vitro and in vivo antioxidant evaluation and estimation of total phenolic, flavonoidal content of *Mimosa pudica* L. *Pharmacognosy research*. 2016 Jan;8(1):22.

- [17] Khan NI, Hatapakki BC. Preliminary Pharmacognostic and Phytochemical Evaluation of Stems of *Mimosa hamata* (Willd). *Int J Sci Res Sci*. 2019;6:159-65.
- [18] Nzeakor TA, Udobi MI, Eke IG, Ezech IO, Idika KI, Eze UU, Dan-Jumbo SO, Nwosu CO. Evidence-based investigations into the ethnoveterinary use of *Mimosa pudica* L.(Fabaceae) as an anthelmintic. *Tropical Journal of Pharmaceutical Research*. 2020;19(12):2623-30.
- [19] Saraswat N, Wal P, Pal RS, Wal A, Pal Y, Pandey A. Pharmacognostic Evaluation and Standardization of the leaves of *Mimosa pudica*, leaves of *Murraya koenigii* and root of *Asparagus racemosus*. *Research Journal of Pharmacy and Technology*. 2020;13(12):5743-8.
- [20] Shivani A, Kumar R, Kumar A, Singh RK, Abdullah SM. A Detailed Pythopharmacological And Biochemical Review On *Mimosa Pudica* (Laajvanti): A Potent Medicinal Plant. *Seed*.;29(31):39.
- [21] Jagetia GC, Lahlmangaihi C. Phytochemical profiling and antioxidant activity of Lajwanti *Mimosa pudica* Linn. in vitro. *Int J Plant Stud*. 2018;1:1-3.
- [22] Sutar NG, Sutar UN, Behera BC. Antidiabetic activity of the leaves of *Mimosa pudica* Linn. in albino rats. *Journal of herbal medicine and toxicology*. 2009;3(1):123-6.
- [23] Ambikabothy J, Ibrahim H, Ambu S, Chakravarthi S, Awang K, Vejjayan J. Efficacy evaluations of *Mimosa pudica* tannin isolate (MPT) for its anti-ophidian properties. *Journal of ethnopharmacology*. 2011 Sep 1;137(1):257-62.
- [24] Jangme C, Kadasi S, Ardad R, Patil V, Kholkumbe A, Patil S. The Shy Healer: Exploring the Ethnopharmacology, Phytochemicals, and Biomedical Applications of *Mimosa Pudica* L.
- [25] Ahuchaogu AA, Ogbuehi GI, Ukaogo PO, Otuokere IE. Gas Chromatography Mass Spectrometry and Fourier transform Infrared Spectroscopy analysis of methanolic extract of *Mimosa pudica* L. leaves. *J Drugs Pharm Sci*. 2020 Apr;4(1):1-9.
- [26] Lan PT, Huyen NT, Kim SY, Hang PT, Tung BT. Phytochemical analysis and protective effect of ethanolic extract of *Mimosa pudica* Linn. on methylglyoxal-induced glucotoxicity. *Journal of Applied Pharmaceutical Science*. 2021 Jul 25;11(9):93-101.
- [27] Kannan S, Jesuraj SA, Kumar ES, Saminathan K, Suthakaran R, Kumar MR, Devi BP. Wound healing activity of *Mimosa pudica* Linn formulation. *Inter J Pharmtech Research*. 2009;1(4):1554-8.
- [28] Khalid MS, Kumar SJ, Suresh DK, Singh RK, Reddy IN, Kumar S. Evaluation of anti-diarrhoeal potential of ethanolic extract of *Mimosa pudica* leaves. *International Journal of Green Pharmacy (IJGP)*. 2011;5(1).
- [29] Rajendran R, Krishnakumar E. Hypolipidemic activity of chloroform extract of *Mimosa pudica* leaves. *Avicenna Journal of Medical Biotechnology*. 2010 Oct;2(4):215.
- [30] Mambou, H.M.A.Y., Pale, S., Bopda, O.S.M., Jugha, V.T., Musa, N.S.O., Ojongnkpot, T.A., Wanyu, B.Y., Bila, R.B., Herqash, R.N., Shahat, A.A. and Taiwe, G.S., 2025. *Mimosa pudica* L. aqueous extract protects mice against pilocarpine–picrotoxin kindling-induced temporal lobe epilepsy, oxidative stress, and alteration in GABAergic/cholinergic pathways and BDNF expression. *Frontiers in Pharmacology*, 15, p.1301002.
- [31] Zhang J, Yuan K, Zhou WL, Zhou J, Yang P. Studies on the active components and antioxidant activities of the extracts of *Mimosa pudica* Linn. from southern China. *Pharmacognosy magazine*. 2011 Jan;7(25):35..